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5

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8

9 Title of the Invention

10

11 Mapping Part Numbers and Other Identifiers

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13 Background of the Invention

14

15 This application claims the benefit of U. S. Provisional Application No. 60/473,093

16 filed 05/23/03 (Attorney Docket No. 215.1014.01) hereby incorporated by reference.

17

18 *I. Field of the Invention*

19

20 This invention relates to associating part numbers from multiple vendors with a

21 universal part number for use in a collaborative tracking network.

22

1 2. *Related Art*

2
3 For ease in record keeping, it has become customary for a seller to use an alpha-
4 numeric code to precisely identify a particular good. It is generally recognized that such systems
5 provide information more efficiently and accurately than verbal descriptors directed to the nature
6 of an item. One such system that has come into almost universal use involves stock keeping
7 numbers (SKUs). Sellers can generally evaluate their inventory by referring to SKU numbers
8 without resort to verbal descriptors.

9
10 One drawback to alpha-numeric codes is that persons interested in buying a prod-
11 uct may not be familiar with the code. For this reason, such alpha-numeric codes are not com-
12 monly used in marketing, sales or in most non-electronic transactions. If used at all in such con-
13 texts, the alpha-numeric code is for the benefit of the seller, not the buyer.

14
15 One solution to this problem is to use an additional verbal description of a good.
16 For example, when ordering an auto part, it is useful to refer to both the part name as well as the
17 part number. This combined use of a verbal descriptor and alphanumeric code minimizes confu-
18 sion on the part of the both the seller and the buyer: the verbal descriptor provides a degree of
19 certainty for the buyer (especially those buyers who are relatively unfamiliar with buying auto
20 parts) and the alpha-numeric identifier streamlines record keeping for the seller.

21
22 Use of additional verbal description is not always possible however – either be-
23 cause the additional verbiage creates confusion or because it is not conventional to use it. For
24 example, in many industries, including the electronics industry, it is customary to refer to a part

1 solely by a part number. In such instances, the confusion that results from using just a part num-
2 ber is compounded when many different manufacturers make identical or similar parts and each
3 manufacturer uses a different alpha-numeric code to identify the part. Under these circum-
4 stances, a seller may generate a BOM (bill of manufacture) or a PO (purchase order) (PO) that is
5 not understood by the recipient of the document. This practice makes it difficult to compare the
6 actual product ordered with the documentation that accompanies it. The problem is further com-
7 pounded during the billing process because it is unclear what materials a bill refers to.

8
9 The need for a system of part numbers that is easily understood is particularly
10 critical in electronic systems for collaborative design and supply chain management. Such sys-
11 tems may include numerous entities that produce similar parts, but identify them differently. Ac-
12 cordingly, it would be desirable to provide a technique for mapping part numbers from multiple
13 vendors that is not subject to the drawbacks of the known art.

14 15 Summary of the Invention

16
17 The invention includes a method and system for mapping part numbers and other
18 identifiers for design collaboration and supply chain management in a networking environment.

19
20 In a first aspect of the invention, a database (1) creates an association between part
21 numbers that are directed to comparable parts, (2) generates a universal part number for compa-
22 rable parts, and (3) creates an association between the part numbers and the universal part num-
23 ber. For example, Mega-Corp produces 12-microfarad capacitors and identifies them using al-
24 pha-numeric "xo12345x.1.1". Giganto Inc. also produces 12-microfarad capacitors of compara-

1 ble quality and identifies them using alpha-numeric PF9876.3. A universal number is generated
2 such that it may be used to refer to both xo12345x.1.1 and PF9876.3. An association is created
3 between the part numbers and the universal part number such that when information is sent to an
4 entity in a supply chain, the information includes a number that the entity is familiar with. This
5 set of associations helps present part-number mismatches and clarifies communications between
6 parties.

7 In a preferred embodiment, the database includes a set of associations between
8 compatible parts. This set of associations is particularly useful determining which parts can be
9 used to fill a particular order.
10

11 In other embodiments, the set of associations may include associations between
12 different job titles that are used for comparable jobs. This is particularly useful for entities that
13 supply workers to a work site. For example, a hazmat technician level 1 may be variously identi-
14 fied as an entry-level field safety chemist, a safety tech officer or some other job title. In these
15 other embodiments, a universal number may be generated and a set of associations may be drawn
16 between each comparable job title and the universal number. This set of associations may be
17 used to benefit prospective employers, prospective employees and employment agencies.
18

19 In a second aspect of the invention, limitations are placed on what authorities may
20 provide information about a set of associations. These limitations are implemented by a man-
21 agement interface that manages data in the database. Generally, only the supplier of a part or the
22 supplier of a comparable part may create associations between their parts. This limitation helps
23 maintain the integrity of information in the database.
24

1 In a preferred embodiment, this database is coupled to a shared service network
2 such as a hub for design collaboration or supply chain control. In such embodiments, the data-
3 base is coupled to a gateway to that used to translate BOMS and other documents into a format
4 that is readily understood by the recipient of the document. This prevents confusion and ensures
5 that transactions conducted by way of the system coupled to the database are readily comprehen-
6 sible to all parties.

7 8 Brief Description of the Drawings

9
10 Figure 1 shows a block diagram of a system for mapping part numbers and other
11 identifiers as used in a design collaboration and supply chain network.

12
13 Figure 2 shows a database structure for a database that is used to map part num-
14 bers.

15
16 Figure 3 shows a process flow diagram for a method of mapping part numbers and
17 other identifiers.

18 19 Detailed Description of the Preferred Embodiment

20
21 In the following description, a preferred embodiment of the invention is described
22 with regard to preferred process steps and data structures. Those skilled in the art would recog-
23 nize after perusal of this application that embodiments of the invention can be implemented us-
24 ing one or more general purpose processors or special purpose processors or other circuits

1 adapted to particular process steps and data structures described herein, and that implementation
2 of the process steps and data structures described herein would not require undue experimenta-
3 tion or further invention.

4
5 *Related Applications*

6
7 Inventions described herein can be used in conjunction with inventions de-
8 scribed in the following application(s):

- 9
10 • Application Serial No. 09/823,888, filed in the name of inventor Greg Clark, titled "Private
11 Collaborative Planning in a Many-to-Many Hub", filed on March 30, 2001, attorney docket
12 number 215.1001.01 and assigned to the same assignee.

13
14 This application is hereby incorporated by reference as if fully set forth
15 herein.

16
17 *Lexicography*

18
19 As used herein, use of the following terms refer or relate to aspects of the inven-
20 tion as described below.

- 1 • **Universal number** – as used herein, a “universal number” refers to an identifier that is used
2 by design collaboration systems, supply chain management systems or other shared service
3 networks to identify a particular part.
4
- 5 • **Translator** – as used herein, a “translator” is an engine that refers to a database that includes
6 proprietary part numbers and universal numbers and converts them from one numbering
7 scheme to another so as to provide a user with a more familiar numbering scheme.
8
- 9 • **Management module** – as used herein, a “management module” controls who has the
10 authority to enter part numbers into the database and assign universal numbers.
11

12 These descriptions of these terms are not intended to be limiting, only illustrative.
13 Other and further applications of the invention, including extensions of these terms and concepts,
14 would be clear to those of ordinary skill in the art after perusing this application. These other and
15 further applications are part of the scope and spirit of the invention, and would be clear to those
16 of ordinary skill in the art, without further invention or undue experimentation.
17

18 *System Elements*

19

20 Figure 1 shows a block diagram of a system for mapping part numbers and other
21 identifiers as used in a design collaboration and supply chain network.
22

1 A system for mapping part numbers and other identifiers as used in a design col-
2 laboration and supply chain network (shown by general character reference 100) includes one or
3 more dedicated servers 110, a set of client workstations 130 and a network 140.

4
5 Each of the one or more dedicated servers 110 includes an input element 111, a
6 presentation element 112, a local memory 113, web server software 114, a first database 116 for
7 storing information relevant to transactions conducted at the web, and a parts module 118.

8
9 The web server software 114 is used to generate a series of web pages dedicated
10 to providing a technique for commercial supply chain management, design collaboration and
11 other business transactions that involve the acquisition and sale of parts, components and other
12 fungible goods. Additional software is used to execute such transactions.

13
14 The first database 116 includes information regarding trading partners, available
15 goods, trading preferences, design projects and other information such as necessary to conduct
16 commerce.

17
18 The parts module 118 includes a second database 120, a management module 122,
19 and a translation module 124. The second database 120 includes all of the part numbers that
20 have been used or are likely to be used by all trading partners. The management module 122 in-
21 cludes a rule base governing who may add information to the second database 120 and a tech-
22 nique for managing information therein. The translation module 124 includes a technique for
23 receiving a document (such as a purchase order) that includes one set of part numbers, translating
24 that set of part numbers to a different set of numbers that are meaningful to a supplier of those

1 parts, and generating a BOM on behalf of a particular party that includes a set of part numbers
2 that are meaningful to the recipient of the BOM. This translation module may be used to trans-
3 late part numbers on other documents such as bills of lading, shipping receipts, bills, back order
4 documents and any other such documents that include part numbers.

5 Although preferably stored at the one or more servers 110, the parts module 118,
6 second database 120, management module 122 and translation module 124 may be stored in any
7 location that is logically local to the one or more servers 110.

8
9 A preferred embodiment of the one or more servers 110 includes a general-
10 purpose computer, such as a laptop or workstation. However, one or more of the servers 10 can
11 also include (either alone or in conjunction with a laptop or workstation), a personal digital as-
12 sistant (such as a "Palm Pilot" or other hand-held device), a portable computer, a special purpose
13 computer, a cellular telephone or other telephonic device or another device. In alternative em-
14 bodiments, the one or more servers 110 may also include any other device disposed for perform-
15 ing the all or some functions described herein.

16
17 Additional description of the web server and the activities provided thereby
18 is provided in patent application no. 08/823,888 in the Incorporated Disclosures.

19
20 Each client workstation included in the set of client workstations 130 includes an
21 input element 131, a presentation element 132, a local memory 133 and a network interface 134.
22 Each client workstation in the set of workstations 130 is under the control of a user 135 who
23 wishes engage is design collaboration, supply chain management, place an order for parts or en-
24 gage in any other transaction with the one or more dedicated servers 110.

Similar to the one or more dedicated servers 110, each client workstation included in the set of client workstations 130 includes a general-purpose computer, such as a laptop or workstation. However, each client workstation can also include (either alone or in conjunction with a laptop or workstation), a hand-held calendar (such as a "Palm Pilot" or other hand-held device), a portable computer, a special purpose computer, a cellular telephone or other telephonic device, a web server acting as the agent for a user, or another device. In alternative embodiments, a client workstation may also include any other device disposed for performing the all or some functions described herein.

The communication network 140 is disposed for communicating data between the one or more servers 110 and the set of client workstations 130. In a preferred embodiment, the communication network 140 includes a packet switched network such as the Internet, as well as (in conjunction with or instead of) an intranet, an enterprise network, an extranet, a virtual private network or a virtual switched network. In alternative embodiments, the communication network 140 may include any other set of communication links that couple the one or more servers 110 and the set of client workstations 130.

Figure 2 shows a database structure for use in a database used to map part numbers.

A database structure 200 includes a first set of data fields 205, a second set of data fields 210, a first set of associations 115 and a second set of associations 220. This structure is used in the database 120 that is included in parts module 118.

Each data field included in the first set of data fields 205 has a universal number. In a preferred embodiment, these universal numbers are either numerical or alpha-numerical. In other embodiments, different types of identification schemes may be used, such as schemes that involve symbols. Each universal number included in the first set of data fields 205 is unique. These universal numbers are created and manipulated only by the management module 122.

Each data field included in the second set of data fields 210 includes a proprietary part number. These proprietary part numbers are generally alpha-numerical, but may include any other proprietary identifiers for parts and components such as may be used by a business to identify its goods. Generally, a new proprietary part number may only be entered into this portion of database 118 according to the rulebase of the management module 122 described above. For example, part numbers associated with a particular division of Engulf & Devour, Inc. must be initially entered by an authority from that division of Engulf & Devour. This practice prevents confusion and maintains the integrity of database 118.

A first set of associations 215 exists between each universal number in the first set of data fields 205 and one or more proprietary part numbers in the second set of data fields. 210. These associations may only be created by the management module 122. The associations between the universal number and the proprietary numbers are used to identify identical or approximately identical parts or components.

1 The purpose of the set of associations 215 is to minimize confusion in ordering,
2 billing, shipping, receiving and other areas of a pertaining to a transaction that involve the use of
3 part numbers.

4
5 This first set of associations 215 permits a user (generally, a business involved
6 with the system 100) to generate a purchase order for goods using a set of part numbers that are
7 familiar to them and to receive a BOM that includes numbers with which they are familiar, re-
8 gardless of what company actually supplied the parts used to fill the order. For example, an order
9 is placed for 500 units of widgets, proprietary part number ED 0001. When the order is received
10 by the system 100, the proprietary part number ED 0001 is translated into a universal number
11 0000 by the translation module 124. This universal number is associated not only with ED 0001,
12 but with parts comparable to ED 0001 that are made by other manufacturers or sold by different
13 suppliers. The associations are responsive to data input by persons or computer programs such
14 as indicated by the rule base in the management module 122. When the goods are shipped, the
15 BOM includes (among other things) the same proprietary part numbers that the purchaser ini-
16 tially requested, thereby making it easier for workers in receiving to determine whether the order
17 was correctly filled.

18
19 The set of associations 220 includes different relations between data fields in
20 the second set of data fields 210. This set of associations 220 links comparable goods. For ex-
21 ample, an association in the set of associations 220 may include links to all 10 ohm resistors.
22 The purpose of this set of associations 220 is to draw parallels between comparable goods.
23 These may reflect individual agreements between particular companies.

Method of Use

Figure 3 shows a process flow diagram for a method of mapping part numbers and other identifiers.

A method 300 is performed by the system 100 and data structure 200. Although the method 300 is described serially, the steps of the method 300 can be performed by separate elements in conjunction or in parallel, whether asynchronously, in a pipelined manner, or otherwise. There is no particular requirement that the method 300 be performed in the same order in which this description lists the steps, except where so indicated.

In a flowpoint 305, a user 135 uses a client device included in the set of client devices 130 to access one or more of the dedicated servers 110. The user 135 may wish to conduct an activity such as ascertain parts availability, check a parts shipment, order parts or conduct any other activity that involves using a part number. Although this method is directed to ordering a part, other activities involving the parts module 118 are within the scope of the invention.

In a step 310, the user 135 creates a list of parts that he wishes to purchase. This list includes part numbers with which the user 135 is familiar, such as his own part number (that is, if the user 135 is a manufacturer or supplier of the desired part), the part numbers of a frequently used supplier, or the numbers found in an on line catalog, either at this site, other web sites or a mail-order catalog.

1 In a step 320, the user 135 transmits the list to the one or more dedicated servers
2 110 over network 140.

3
4 In a step 325, software at the one or more dedicated servers 110 determines the
5 relative availability of the parts requested by user 135. This may involve looking to parts from
6 other companies or parts that are identified by other numbers than those specified by the user 135
7 in step 315. This is done by translating the proprietary part number provided by the user 135 into
8 a universal number and checking what parts are associated with that universal number. In this
9 step, the order is filled using such parts as are available, or from suppliers or manufacturers that
10 the user 135 has a stated preference for.

11
12 In a step 335, a record of the true part numbers and the amounts of the parts or-
13 dered or backordered is stored in the first database 116. Any other such alternations to database
14 116 that are required (such as adjusting the general availability of parts) are made at this time.

15
16 In a step 340, the translation module looks to the true proprietary numbers and
17 translates them back to the numbers that were originally provided by the user 135 in step 315.
18 The translation module generates a BOM or other such shipping papers or electronic records and
19 transmits the record back to the user 135. In this way the user 135 has a record of the transaction
20 that is readily comprehensible to him. Additional and further information may also be included
21 in this record, such as the manufacturers or suppliers who provided the parts and other billing
22 information.

Generality of the Invention

The invention has general applicability to various fields of use, not necessarily related to generation of start pages as described above. For example, these fields of use can include one or more of, or some combination of, the following:

- Associating multiple job titles for comparable positions to a universal job title.

This can be used by employment agencies and other entities in which people are categorized by their job.

- Associating different business formats with a universal format and translating the universal format into one that is preferred by a user.

This can be used when generating bills and other documents on behalf of a client who desires a particular type of billing format.

Alternative Embodiments

Although preferred embodiments are disclosed herein, many variations are possible which remain within the concept, scope, and spirit of the invention, and these variations would become clear to those skilled in the art after perusal of this application.